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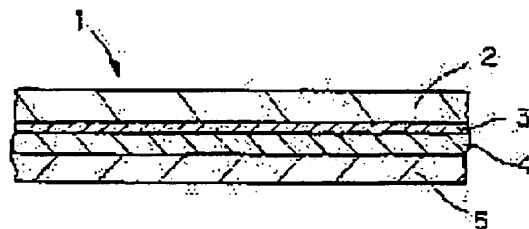
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## (54) TRANSPARENT ELECTROCONDUCTIVE HEAT SEAL MATERIAL AND CARRIER TAPE LID BODY USING THE SAME

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a transparent, electrically conductive heat seal material having performance of static protection not to lower even in a low humidity atmosphere and also a transparency such that an article placed in the lidded container is visible from the outside and provide a carrier tape lid body using the above material.

**SOLUTION:** This transparent, electrically conductive heat seal material, characterized in that it comprises a heat-sealable synthetic resin and electrically conductive particles having a 50% particle diameter of  $\geq 0.4 \mu\text{m}$  in order to attain the above purposes.



LEGAL STATUS

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CLAIMS

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[Claim(s)]

[Claim 1] Transparent conductive heat-sealing material characterized by the synthetic resin which can be heat sealed coming at least to distribute the conductive particle whose particle size is 0.40 micrometers or less 50%.

[Claim 2] Transparent conductive heat-sealing material according to claim 1 to which the surface resistivity of said transparent conductive heat-sealing material is characterized by being 104-1012ohms / \*\*.

[Claim 3] Transparent conductive heat-sealing material according to claim 1 or 2 characterized by being the optical property that the total light transmission in the laminating member obtained by the optical property of said transparent conductive heat-sealing material carrying out the laminating of this transparent conductive heat-sealing material and other laminated woods becomes 70% or more and less than [ Hayes 25% ].

[Claim 4] Transparence conductivity heat-sealing material given in one from claim 1 characterized by said conductive particle being a needlelike particle to claim 3 of claims.

[Claim 5] Transparence conductivity heat-sealing material according to claim 4 characterized by said conductive particle being a particle which gave conductivity to the metallic oxide.

[Claim 6] Transparent conductive heat-sealing material according to claim 5 to which the particle which gave conductivity to said metallic oxide is characterized by being the acicular powder of antimony doping tin oxide.

[Claim 7] Heat-sealing material given in one from claim 1 characterized by the synthetic resin in which said heat sealing is possible consisting of either or these combination of polyester resin, polyurethane resin, vinyl chloride vinyl acetate copolymer resin, acrylic resin, and ethylene-vinylacetate copolymer resin to claim 6 of claims.

[Claim 8] The carrier tape lid characterized by including at least the cushion layer arranged between the heat-sealing layer which is formed in one from above-mentioned claim 1 to claim 7 of claims from the transparent conductive heat-sealing material of a publication, and is heat sealed by the carrier tape, the outer layer formed from a biaxially oriented film, and said heat-sealing layer and outer layer.

[Claim 9] Said cushion layer is a carrier tape lid according to claim 8 characterized by being the layer which uses polymeric materials with low degree of crystallinity as a principal component.

[Claim 10] For said cushion layer, a consistency is 3 0.900-0.910g/cm. Carrier tape lid according to claim 8 characterized by being the layer formed with the polyolefine whose weight average molecular weight it is within the limits and is within the limits of 20,000-100,000.

[Claim 11] Said cushion layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. Ethylene-alpha olefin copolymer, A 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight [ of butadienes ] styrene-butadiene block copolymer, Among the hydrogenation object of a 10 - 50 % of the weight of styrene, and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer, and high impact polystyrene, at least an ethylene-alpha olefin copolymer and a styrene-butadiene block copolymer The carrier tape lid according to claim 8 characterized by being formed with three or more sorts of included resin.

[Claim 12] Said cushion layer is two-layer structure with the 2nd resin layer which touches the 1st resin layer and said heat-sealing layer. Said 1st resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It is formed with an ethylene-alpha olefin copolymer. Said 2nd resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section The carrier tape lid according to claim 8 characterized by being formed with the resin constituent with which the hydrogenation object 5 of a 10 - 50 % of the weight of styrene and

90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections are added. [Claim 13] Said cushion layer is a three-tiered structure with the 3rd resin layer which touches the 1st resin layer, the 2nd resin layer, and said heat-sealing layer. Said 1st resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It is formed with an ethylene-alpha olefin copolymer. Said 2nd resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, It is formed with a 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent. Said 3rd resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section The carrier tape lid according to claim 8 characterized by being formed with the resin constituent with which the hydrogenation object 5 of a 10 - 50 % of the weight of styrene and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections are added.

[Claim 14] The carrier tape lid characterized by including at least the primer layer arranged between the cushion layer arranged between the heat-sealing layer which is formed in one from above-mentioned claim 1 to claim 7 of claims from the transparent conductive heat-sealing material of a publication, and is heat sealed by the carrier tape, the outer layer formed from a biaxially oriented film, and said heat-sealing layer and outer layer, and said heat-sealing layer and said cushion layer.

[Claim 15] Said primer layer is 0 - 100 % of the weight of styrene-ethylene-butylene-styrene copolymers, and a carrier tape lid according to claim 14 characterized by being formed with the 100 - 0 % of the weight [ of styrene-ethylene-butylene-styrene copolymers by which acid denaturation was carried out ] resin constituent.

[Claim 16] The carrier tape lid according to claim 15 characterized by acrylic rubber being added by the resin constituent which forms said primer layer at 60 or less % of the weight of a rate of the whole resin constituent.

[Claim 17] The carrier tape package object characterized by coming to heat seal the stowage which contains the packed body for the carrier tape lid of a publication to one from said claim 8 to claim 16 of claims on the carrier tape which it has continuously.

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[Translation done.]

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the transparency conductivity heat-sealing material used suitable for the lid of the carrier tape package object used at the time of storage of the electronic product which is easy to damage with static electricity especially a chip mold electronic product, an electronic-circuitry substrate [ finishing / component mounting ], etc., transportation, and wearing, and the carrier tape lid using this.

[0002]

[Description of the Prior Art] Chip mold electronic parts for surface mounts, such as transistors including IC, diode, a capacitor, and a piezoelectric-device register, in recent years The carrier tape made from plastics which formed continuously the pocket which can be contained, and by which embossing shaping was carried out according to the configuration of electronic parts (it considers as a carrier tape hereafter.) The carrier tape lid heat sealed by this carrier tape (it may only consider as a lid hereafter) from -- it is packed by the becoming carrier tape package object, and it is supplied. After the electronic parts of contents exfoliate the lid of the above-mentioned carrier tape package object, they are automatically picked out from a carrier tape and a surface mount is carried out to an electronic-circuitry substrate.

[0003] With the large improvement in a surface mount technology in recent years, the electronic parts to which transportation etc. is carried out with the above-mentioned carrier tape package object are more highly efficient, and have been miniaturized. Such electronic parts may be damaged by discharge of static electricity by a carrier tape embossing internal surface, a lid inside front face, and electronic parts contacting by vibration at the time of carrier tape package object migration. Moreover, the same situation may arise with static electricity which generates a lid in case it exfoliates from a carrier tape. Therefore, the electrostatic measures to a carrier tape and a lid were taken the problem of the utmost importance.

[0004] Conventionally, about the antistatic treatment (electrostatic processing) of a carrier tape, the carbon black to the quality of the material used scours, or it is performed by coating, and that with which are satisfied of the effectiveness was obtained. However, the transparency which is extent which can check contents by looking is needed about a lid. Therefore, since the same antistatic treatment as a carrier tape could not be performed, the following antistatic treatment was proposed.

[0005] \*\* Scour a surface-active-agent system antistatic agent to plastics, or it carries out coating to it on a plastics front face. \*\* Carry out the laminating of the aluminum foil. \*\* Carry out coating of the plastic resin which scoured metallic-oxide system electric conduction agents, such as tin oxide, to a front face.

[0006] However, by the approach of the above-mentioned \*\*, by the approach of \*\* and \*\*, there was a problem that the antistatic engine performance will fall or disappear under low humidity conditions, and the transparency of a lid was not securable, and or it was hard to check contents by looking, there was a problem that it could not check by looking at all.

[0007]

[Problem(s) to be Solved by the Invention] This invention makes it a key objective to offer the carrier tape lid using the transparency conductivity heat-sealing material and this which have the transparency of extent which it is made in order to solve the above-mentioned trouble, and the antistatic engine performance does not fall with low humidity, either, and can check contents by looking.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention offers the transparent conductive heat-sealing material characterized by the synthetic resin which can be heat sealed coming at least to distribute the conductive particle whose particle size is 0.40 micrometers or less 50% in

claim 1.

[0009] Thus, since the conductive particle to which 50% particle size has the particle size below the short wavelength region of the light of 0.40 micrometers or less in the synthetic resin which can be heat sealed distributes and contains the transparent conductive heat-sealing material of this invention, it can be made into the heat-sealing material which has conductivity and was excellent in transparency.

[0010] In invention indicated by above-mentioned claim 1, so that it may indicate to claim 2 It is desirable that the surface resistivity of the above-mentioned transparent conductive heat-sealing material is  $10^4$ - $10^{12}$ ohms / \*\*, and it sets to transparent conductive heat-sealing material according to claim 1 or 2. It is desirable that it is the optical property that the total light transmission in the laminating member obtained by the optical property of the above-mentioned transparent conductive heat-sealing material carrying out the laminating of this transparent conductive heat-sealing material and other laminated woods becomes 70% or more and less than [ Hayes 25% ] so that it may indicate to claim 3. It is because there are the antistatic property and optical property which are needed within limits mentioned above when the transparent conductive heat-sealing material of this invention is used as heat-sealing material in the lid of the carrier tape which is the most suitable application in the laminating member obtained by carrying out a laminating.

[0011] In invention indicated by one from above-mentioned claim 1 to claim 3 of claims, it is desirable that the above-mentioned conductive particle is a needlelike particle so that it may indicate to claim 4. If needlelike, even when it is little, from possibility that contact between each particle distributed in the synthetic resin which can be heat sealed is maintained being high, it is effective in lowering the electric resistance as the whole. It is because it is an ingredient desirable for raising the antistatic effectiveness, maintaining transparency since transparency is also still better.

[0012] It is desirable that the above-mentioned conductive particle is a particle which gave conductivity to the metallic oxide, and it is desirable that the particle which gave conductivity to the above-mentioned metallic oxide is the acicular powder of antimony doping tin oxide so that it may indicate to claim 6 especially, so that invention given in above-mentioned claim 4 may be indicated at claim 5. When the acicular powder of antimony doping tin oxide takes into consideration the ease of acquisition, an engine-performance side, etc. as needlelike powder of a conductive particle also in the particle which gave conductivity to the metallic oxide, it is because it is desirable.

[0013] In invention indicated by one from above-mentioned claim 1 to claim 6 of claims, it is desirable that it is what the synthetic resin in which the above-mentioned heat sealing is possible becomes from either or these combination of polyester resin, polyurethane resin, vinyl chloride vinyl acetate copolymer resin, acrylic resin, and ethylene-vinylacetate copolymer resin so that it may indicate to claim 7.

[0014] This invention is formed in one from above-mentioned claim 1 to claim 7 of claims from the transparent conductive heat-sealing material of a publication, and offers the carrier tape lid characterized by including at least the cushion layer arranged between the heat-sealing layer heat sealed by the carrier tape, the outer layer formed from a biaxially oriented film, and the above-mentioned heat-sealing layer and an outer layer so that it may indicate to claim 8 further.

[0015] It does so the effectiveness that a check by looking of contents can also be performed, having the good antistatic engine performance, when the carrier tape lid of this invention is heat sealed by the carrier tape, since the heat-sealing layer is formed by transparent conductive heat-sealing material which was mentioned above.

[0016] In invention indicated by above-mentioned claim 8, as for the above-mentioned cushion layer, what is the layer which uses polymeric materials with low degree of crystallinity as a principal component is desirable so that it may indicate to claim 9. By using polymeric materials with low degree of crystallinity as a principal component, contraction of a cushion layer can be suppressed in the production process of a carrier tape lid. It is because curl of the carrier tape lid resulting from contraction of a cushion layer can be prevented by this and workability becomes good.

[0017] Moreover, for the above-mentioned cushion layer, a consistency is  $0.900$ - $0.910$ g/cm so that invention indicated by above-mentioned claim 8 may be indicated to claim 10. You may come to be formed with the polyolefine whose weight average molecular weight it is within the limits and is within the limits of  $20,000$ - $100,000$ . Since cushioning properties improve by choosing such an ingredient as a cushion layer, it becomes possible to reduce the thickness as a cushion layer. Thus, by reducing the thickness of a cushion layer, it is because it is possible to decrease contraction of the cushion layer at the time of manufacture, curl of the carrier tape lid obtained as a result can be prevented and workability improves.

[0018] Furthermore, it sets to invention indicated by above-mentioned claim 8. So that it may indicate to claim 11 the above-mentioned cushion layer A consistency  $0.915$  -  $0.940$  g/cm<sup>3</sup> Ethylene-alpha olefin

copolymer, A 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight [ of butadienes ] styrene-butadiene block copolymer, Among the hydrogenation object of a 10 - 50 % of the weight of styrene, and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer, and high impact polystyrene, at least an ethylene-alpha olefin copolymer and a styrene-butadiene block copolymer You may be the layer currently formed with three or more sorts of included resin.

[0019] Moreover, it sets to invention indicated by claim 8. So that it may indicate to claim 12 the above-mentioned cushion layer It is two-layer structure with the 2nd resin layer which touches the 1st resin layer and the above-mentioned heat-sealing layer. The above-mentioned 1st resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It is formed with an ethylene-alpha olefin copolymer. The above-mentioned 2nd resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section You may be the layer currently formed with the resin constituent with which the hydrogenation object 5 of a 10 - 50 % of the weight of styrene and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections are added.

[0020] Furthermore, it sets to invention indicated by claim 8. So that it may indicate to claim 13 the above-mentioned cushion layer It is a three-tiered structure with the 3rd resin layer which touches the 1st resin layer, the 2nd resin layer, and the above-mentioned heat-sealing layer. The above-mentioned 1st resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It is formed with an ethylene-alpha olefin copolymer. The above-mentioned 2nd resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, It is formed with a 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent. The above-mentioned 3rd resin layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section You may be the layer currently formed with the resin constituent with which the hydrogenation object 5 of a 10 - 50 % of the weight of styrene and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections are added.

[0021] The heat-sealing layer which is formed in one from above-mentioned claim 1 to claim 7 of claims from the transparent conductive heat-sealing material of a publication, and is heat sealed by the carrier tape so that this invention may be further indicated to claim 14, The carrier tape lid characterized by including at least the primer layer arranged between the cushion layer arranged between the outer layer formed from a biaxially oriented film, and the above-mentioned heat-sealing layer and an outer layer, and the above-mentioned heat-sealing layer and the above-mentioned cushion layer is offered.

[0022] Since it has the description to arrange the primer layer further between the heat-sealing layers and cushion layers in a carrier tape lid, the carrier tape lid of this invention can be preferably applied, when it is required that the delamination between a cushion layer and a heat-sealing layer should be controlled especially, or when it is required that the adhesive property of a cushion layer and a heat-sealing layer should be raised. Therefore, since the lid of this invention with which the primer layer was prepared can raise the feeling of beauty at the time of exfoliating the lid heat sealed by the carrier tape since the delamination between a cushion layer and a heat-sealing layer was controlled and the adhesive property of a cushion layer and a heat-sealing layer can be raised, the adhesive strength of a lid can be adjusted more than moderate reinforcement.

[0023] Moreover, in invention indicated by claim 14, as for the above-mentioned primer layer, it is desirable to be formed with the 0 - 100 % of the weight of styrene-ethylene-butylene-styrene copolymers and 100 - 0 % of the weight [ of styrene-ethylene-butylene-styrene copolymers by which acid denaturation was carried out ] resin constituent so that it may indicate to claim 15. According to this invention, while being able to raise the adhesive property of a primer layer and a cushion layer notably, the adhesive property of a primer layer and a heat-sealing layer can also be raised. Consequently, the heat-sealing layered product of this invention can paste up a cushion layer and a heat-sealing layer by sufficient strength by minding such a primer layer.

[0024] Moreover, in invention indicated by claim 14, to the resin constituent which forms the above-mentioned primer layer, it is more desirable that acrylic rubber is added at 60 or less % of the weight of a rate of the whole resin constituent so that it may indicate to claim 16. According to this invention, by adding acrylic rubber at 60 or less % of the weight of a rate of the whole resin constituent, an operation of a primer layer can be demonstrated further and an adhesive property can be raised further.

[0025] The carrier tape package object characterized by this invention coming to heat seal the stowage which contains the packed body for the carrier tape lid of a publication to one from above-mentioned claim 8 to claim 16 of claims on the carrier tape which it has continuously so that it may indicate to claim 17 further is offered. Since the carrier tape package object of this invention has a carrier tape lid which was mentioned above, it does not do breakage by an electrostatic discharge etc. to the packed body, and does so the effectiveness that contents can be checked by looking.

[0026]

[Embodiment of the Invention] Hereafter, although this invention is explained in detail, after explaining transparent conductive heat-sealing material first, the carrier tape lid which used this transparent conductive heat-sealing material for the heat-sealing layer is explained, and the carrier tape package object which finally possesses this carrier tape lid is explained.

[0027] 1. The transparent conductive heat-sealing material of transparent conductive heat-sealing material this invention has at least the synthetic resin which can be heat sealed, and the conductive particle whose 50% particle size is 0.40 micrometers or less, and has the description at the place where the above-mentioned synthetic resin comes to distribute the above-mentioned conductive particle.

[0028] The synthetic resin which is used for this invention and which can be heat sealed is resin which can generally be used as heat-sealing material, and it will not be limited especially if transparent in a light region. Specifically, the resin which consists of either or these combination of polyester resin, polyurethane resin, vinyl chloride vinyl acetate copolymer resin, acrylic resin, and ethylene-vinylacetate copolymer resin is used. In the carrier tape lid which is the main application of the transparent conductive heat-sealing material of this invention, it is because it is most suitably used in respect of an adhesive property, reinforcement, etc.

[0029] Moreover, as a conductive particle used for this invention, a thing 0.32 micrometers or less has desirable 50% particle size also in a thing 0.40 micrometers [ or less ], especially a thing 0.36 micrometers or less. Each of such particle size is because it is desirable from the field of the transparency reservation from it being below the short wavelength region of the light.

[0030] In addition, 50% particle size means the particle size in which 50% of particle is contained in particle size distribution here.

[0031] Although the conductive particle which has such a particle size may be a granular particle or may be a needlelike particle, when the conductivity at the time of [ same ] carrying out weight addition and transparency take a good point into consideration, it is desirable that it is a needlelike particle.

[0032] Here, suppose that the ratio of the die length of the longitudinal direction of a particle and the width of face of a particle says that 5:1 or more things are needlelike.

[0033] It is not limited especially if it is the particle which has conductivity as a conductive particle used by this invention, and the conductive particle which gave conductivity to sulfides, such as the conductive particle which gave conductivity to metallic oxides, such as metal particles, such as gold, silver, nickel, aluminum, and copper, a carbon black particle, tin oxide, a zinc oxide, and titanium oxide, the conductive particle which gave conductivity to the barium sulfate, zinc sulfide, copper sulfide, a cadmium sulfide, a nickel sulfide, and sulfuration palladium, can be mentioned

[0034] In this invention, what gave conductivity to the metallic oxide of tin oxide, a zinc oxide, or titanium oxide especially is used suitably, and especially the impalpable powder especially of antimony doping tin oxide is desirable. As such antimony doping tin oxide, a volume resistivity is preferably the most desirable 500 or less ohm-m in respect of conductive reservation of the thing of 100 or less ohm-m.

[0035] The transparency conductivity heat-sealing material of this invention is manufactured by making the synthetic resin in which the above-mentioned heat sealing is possible mix and distribute the above-mentioned conductive particle, and is distributed by homogeneity using the dispersant of various organic systems etc.

[0036] Although the mixing ratio of the above-mentioned synthetic resin and the conductive particle in this invention changes with the class of conductive particle, particle size, etc., a conductive particle is usually the 10 - 1000 weight section to the above-mentioned synthetic-resin 100 weight section, and it is the 100 - 800 weight section preferably. When there are few amounts of a conductive particle than the above-mentioned range, since conductivity may be insufficient and a problem may arise for the antistatic engine performance, it is not desirable. Moreover, when there are more amounts of a conductive particle than the above-mentioned range, it is not desirable from various problems, like a problem arises to heat-sealing nature, or the distribution to the above-mentioned synthetic resin becomes difficult arising.

[0037] It is desirable especially desirable that it is within the limits of 104-1012ohms / \*\*, and such surface



resistivity of the transparent conductive heat-sealing material of this invention is within the limits of 106-1011ohms / \*\* most preferably within the limits of 105-1012ohms / \*\*. It is because a problem may arise for the antistatic engine performance, the antistatic engine performance beyond it is not required when higher than the above-mentioned range but it may become a problem in a cost side, when lower than the above-mentioned range.

[0038] Moreover, the total light transmission in the laminating member obtained by carrying out the laminating of this transparent conductive heat-sealing material and other laminated woods of 70% or more and less than [ Hayes 25% ], and total light transmission being 75% or more and less than [ Hayes 23% ], and the optical property that total light transmission becomes preferably especially within the limits 80% or more and not more than Hayes 20%, preferably is [ the optical property of the transparent conductive heat-sealing material of this invention ] desirable.

[0039] Generally the amount of coating in the case of using the transparent conductive heat-sealing material of this invention is 0.1 - 8 g/m<sup>2</sup>, although it changes with applications. It is within the limits. It is because effectiveness seldom changes but poses a problem in cost sides, such as futility of the cost of materials, even when a problem arises in respect of bond strength when fewer than the above-mentioned range, and it applies mostly from the above-mentioned range.

[0040] If such transparent conductive heat-sealing material of this invention is a heat-sealing layer for which transparency and conductivity (antistatic nature) are needed, it can be used for any applications. However, in this invention, especially the thing used for the heat-sealing layer of the carrier tape lid which transparency and both conductive properties are needed and poses a current problem is desirable. The carrier tape lid which used for the heat-sealing layer hereafter the transparence conductivity heat-sealing material mentioned above is explained.

[0041] 2. The carrier tape lid of carrier tape lid this invention is formed from the transparent conductive heat-sealing material mentioned above, and is characterized by including at least the cushion layer arranged between the heat-sealing layer heat sealed by the carrier tape, the outer layer formed from a biaxially oriented film, and the above-mentioned heat-sealing layer and an outer layer. Hereafter, the carrier tape lid of this invention is explained with reference to a drawing.

[0042] Drawing 1 is the outline sectional view showing an example of the carrier tape lid of this invention. The lid 1 is equipped with the outer layer 2 formed from biaxial-stretching resin, and the cushion layer 4 and the heat-sealing layer 5 by which the laminating was carried out to order through the glue line 3 in the outer layer 2 in drawing 1 . In the example shown in above-mentioned drawing 1 , although the glue line 3 is formed between the cushion layer 4 and the outer layer 2, this glue line 3 is a layer formed if needed, and is not an indispensable layer in this invention.

[0043] Hereafter, each class which constitutes the carrier tape lid of this invention is explained.

[0044] (Outer layer) In drawing 1 , an outer layer 2 consists of biaxial-stretching resin films, and can be especially formed with biaxially oriented films, such as polyamide resin, such as polyolefin resin, such as polyester resin, such as polyethylene terephthalate (PET), and polypropylene, and nylon. Especially, the biaxially oriented film of either polyester or polypropylene is used suitably. Thus, thermal resistance can be given to a lid by preparing the outer layer which consists of biaxial-stretching resin. The thickness of an outer layer can be suitably set up according to the purpose of using a lid, for example, can be desirably set to 6-50 micrometers about 3.5-80 micrometers. When thinner than the above-mentioned range, the reinforcement as a carrier tape package object may be insufficient, and heat sealing may become difficult when thicker than the above-mentioned range.

[0045] In addition, surface treatment, such as corona treatment, plasma treatment, and sandblasting processing, may be beforehand performed to the field by the side of the cushion layer of this outer layer if needed, and an adhesive property may be raised to it. Moreover, what performed static electricity generating prevention processing if needed can be used.

[0046] (Glue line) The glue line 3 formed between an outer layer 2 and the cushion layer 4 in drawing 1 is 3 low density polyethylene and the consistency of 0.915-0.940g/cm. It can form with the adhesives of an ethylene-alpha olefin copolymer, a polyethylene vinyl acetate copolymer, an ionomer, polypropylene, polybutadiene, urethane, polyester or the polyolefine that is either of those denaturation objects, an isocyanate system, and an imine system etc., and about 0.2-60 micrometers of thickness are desirable. a glue line -- an outer layer top -- spreading or extrusion molding -- it can carry out -- this glue line top -- a cushion layer -- a dry lamination -- or an extrusion lamination can be carried out. In addition, this layer is a layer formed if needed as it was mentioned above.

[0047] (Cushion layer) Next, the cushion layer formed between an outer layer and a heat-sealing layer is



explained. As a cushion layer used for the lid of this invention, especially if conventionally used for the cushion layer (interlayer) of a carrier tape lid, it will not be limited. For example, it is the cushion layer which consists of either or the mixture of semi-gross density and low density polyethylene, straight chain-like polyethylene, a polyethylene vinyl acetate copolymer, an ethylene methacrylic-acid copolymer (EMAA), an ethylene methyl methacrylate copolymer (EMMA), polypropylene, an ionomer, styrene-Butadiene Styrene, and a styrene-ethylene-butylene-styrene block copolymer, and that whose thickness is about 10-100 micrometers can be mentioned. Moreover, such a cushion layer can be formed with a dry lamination process or an extrusion lamination process.

[0048] however, voice which is explained below in this invention -- three voice, such as a mode (the 1st mode) using a cushion layer [ like ], i.e., the resin of amorphous nature, a mode (the 2nd mode) using low consistency polyolefine, and a mode (the 3rd mode) that mixes and uses olefin system resin and styrene resin, -- a cushion layer [ like ] is desirable especially. Hereafter, it divides and explains to each mode.

[0049] A. the 1st voice -- it needs -- the 1st voice of the cushion layer used suitable for the lid of this invention first -- attach like and explain. As a cushion layer, crystalline resin, such as polyethylene resin, was used from before. However, when such crystalline resin is used for a cushion layer (for example, when carrying out the laminating of the crystalline resin on an outer layer in an extrusion lamination), the problem that a base material curls by crystallization at the time of extrusion occurs. Moreover, even when the laminating of such a crystalline resin film and the film of an outer layer is carried out in a dry lamination as a cushion layer, the problem that the crystalline resin used for the above-mentioned cushion layer will contract, and curl will occur with the heat in the desiccation process in the case of carrying out the laminating of a subsequent primer layer and a subsequent heat-sealing layer using coating liquid arises.

[0050] In this 1st mode, by preventing curl of such a cushion layer, it is made for the purpose of raising the workability in the process which pastes up a lid on a carrier tape, and the above-mentioned cushion layer is characterized by considering as the layer which uses polymeric materials with low degree of crystallinity as a principal component.

[0051] By using polymeric materials with low degree of crystallinity as a principal component, contraction of a cushion layer can be suppressed in the production process of a carrier tape lid. It is because curl of the carrier tape lid resulting from contraction of a cushion layer can be prevented by this and workability becomes good.

[0052] Specifically in the 1st mode, an ionomer, an ethylene methacrylic-acid copolymer (EMAA), an ethylene methyl methacrylate copolymer (EMMA), an ethylene methyl acrylate copolymer (EMA), an ethylene-vinyl acetate copolymer (EVA), etc. can be mentioned with the low polymeric materials of crystallinity.

[0053] Moreover, in the 1st mode, it is based on the class of ingredient to be used besides although polymeric materials with these low degree of crystallinity are used as the principal component of cushion layer material, in case a principal component here forms a cushion layer only using the low polymeric materials of the above-mentioned degree of crystallinity, and the case of the whole where 60 % of the weight or more is used preferably is also shown for polymeric materials with low degree of crystallinity 50% of the weight or more.

[0054] The thickness of the cushion layer in this mode is formed within the limits of 10-100 micrometers like the conventional cushion layer mentioned above.

[0055] Thus, by forming a cushion layer by using polymeric materials with low degree of crystallinity as a principal component, curl of a lid cannot arise at the time of lid formation, and subsequent workability can be raised.

[0056] B. the 2nd voice of the 2nd mode, next the cushion layer used suitable for the lid of this invention -- attach like and explain. It is a mode aiming at preventing curl of a lid like [ the 2nd mode ] the 1st mode.

[0057] namely, the thing which has predetermined thickness in order that the conventional cushion layer may secure the cushioning properties of a lid -- it is -- such a cushion -- \*\*\*\*\* -- if -- the 1st voice of the above -- there was a problem of curling under various conditions as shown like. In this mode, by using the good ingredient of cushioning properties, thickness of a cushion layer is made thin, having cushioning properties equivalent to the conventional cushion layer, and the curl at the time of the lid manufacture which originates in a cushion layer by this is mitigated and prevented.

[0058] what has the description in this mode at the place in which the above-mentioned cushion layer is formed with the good ingredient of cushioning properties -- it is -- as the good ingredient of such cushioning properties -- a consistency -- 0.900-0.910g/cm<sup>3</sup> -- desirable -- 0.901 - 0.909 g/cm<sup>3</sup> It is within the limits and the polyolefine whose weight average molecular weight is within the limits of 30,000-90,000 preferably

within the limits of 20,000-100,000 can be mentioned.

[0059] Specifically as such an ingredient, straight chain-like low density polyethylene etc. can be mentioned.

[0060] The 2nd mode of this cushion layer may be taken as a lid combining the heat-sealing layer which consists of conventional heat-sealing material besides in the case of using like the 1st mode of the above combining the heat-sealing layer using the transparent conductive heat-sealing material mentioned above. Even in such a case, it is because the same effectiveness can be acquired. In addition, in the 1st mode and 2nd mode of this cushion layer, in order to raise an adhesive property, it is desirable to combine with a heat-sealing layer through the primer layer which mentions later whether surface treatment, such as corona treatment, is performed.

[0061] C. the 3rd voice of the cushion layer used for the 3rd mode last suitable for the lid of this invention -- attach like and explain. The 3rd mode has the description at the place which mixes and uses olefin system resin and styrene resin for the purpose of raising an adhesive property with the heat-sealing layer which raises the adhesive property of a cushion layer and a heat-sealing layer, and which was especially formed by the above-mentioned transparent conductive heat-sealing material, securing the cushioning properties which are the functions as a cushion layer. In this mode, when using a cushion layer as a monolayer, and when considering as a bilayer, it may consider as three more layers and each is explained hereafter.

[0062] \*\* When a cushion layer is a monolayer, a cushion layer is a consistency 0.915 - 0.940 g/cm<sup>3</sup> in this case. It is formed with three or more sorts of resin which contains an ethylene-alpha olefin copolymer and a styrene-butadiene block copolymer at least among the hydrogenation object of an ethylene-alpha olefin copolymer, a 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight [ of butadienes ] styrene-butadiene block copolymer, and a 10 - 50 % of the weight of styrene, and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer, and high impact polystyrene.

[0063] The ethylene-alpha olefin copolymer used for formation of a cushion layer is a copolymer of ethylene, and a butene, a pentene, a hexene, a heptene, octene and 4-methyl pentene and 1 grade etc. The consistencies of such an ethylene-alpha olefin copolymer are 0.915 g/cm<sup>3</sup>. The following or 0.940 g/cm<sup>3</sup> When exceeding, the membrane formation nature of the cushion layer by combination with a styrene-butadiene block copolymer falls and is not desirable.

[0064] Moreover, if the adhesiveness of a film increases that the amount of styrene which constitutes the styrene-butadiene block copolymer used for formation of a cushion layer is less than 50 % of the weight, and handling becomes difficult and it exceeds 90 % of the weight, adhesion with the heat-sealing layer in low temperature worsens and is not desirable.

[0065] And the mixing ratio of the ethylene-alpha olefin copolymer and styrene-butadiene block copolymer in a cushion layer influences greatly the peel strength at the time of exfoliating, after heat sealing a lid on a carrier tape, and the transparency of a lid. Let the mixing ratios of the ethylene-alpha olefin copolymer and styrene-butadiene block copolymer in the cushion layer 4 be 10 - 90 % of the weight of ethylene-alpha olefin copolymers, and 70 - 30 % of the weight of styrene-butadiene block copolymers in this invention. When a styrene-butadiene block copolymer exceeds [ the amount of ethylene-alpha olefin copolymers ] 70 % of the weight less than 30% of the weight, the membrane formation nature of a cushion layer becomes low, and the transparency of a lid falls and is not desirable, either. On the other hand, the amount of ethylene-alpha olefin copolymers exceeds 70 % of the weight, when a styrene-butadiene block copolymer is less than 30 % of the weight, the adhesion force of a cushion layer and a heat-sealing layer is too small, and the peel strength of a lid is not less [ fitness reinforcement ], and desirable.

[0066] When using the hydrogenation object and high impact polystyrene of a styrene-butadiene block copolymer for a cushion layer and forming with four sorts of resin, the 10 - 90 % of the weight of the above ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of styrene-butadiene block copolymers ] resin constituent 100 weight section It is desirable to carry out 5-30 weight section addition of the hydrogenation object of a 10 - 50 % of the weight of styrene and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer, and to carry out 5-50 weight section addition of the high impact polystyrene.

[0067] It becomes [ the blocking resistance of the film which will be obtained if the effectiveness which adds the hydrogenation object of a styrene-butadiene block copolymer is not discovered and 30 weight sections are exceeded ] inadequate and is not desirable when the content of the hydrogenation object of a styrene-butadiene block copolymer is under 5 weight sections. When it is not the hydrogenation object which was added as a hydrogenation object of a styrene-butadiene block copolymer in fact, since the butadiene component of this copolymer is high, that it is easy to oxidize, at the time of formation of the

cushion layer 4, it is easy to generate gel and it becomes.

[0068] Moreover, when an anhydrous additive is used, membrane formation precision may be bad and film-izing may be difficult.

[0069] Moreover, if the effectiveness which adds high impact polystyrene is not discovered and 50 weight sections are exceeded when the addition of high impact polystyrene is under 5 weight sections, the transparency of a cushion layer worsens and is not desirable.

[0070] Moreover, the above-mentioned cushion layer may be formed to the 10 - 90 % of the weight of ethylene-alpha olefin copolymers, and 70 - 30 % of the weight [ of styrene-butadiene block copolymers ] resin constituent 100 weight section with the resin constituent which carried out 5-30 weight section addition only of the hydrogenation object of a styrene-butadiene block copolymer, and contained three sorts of resin. Moreover, it may be formed to the 10 - 90 % of the weight of ethylene-alpha olefin copolymers, and 70 - 30 % of the weight [ of styrene-butadiene block copolymers ] resin constituent 100 weight section with the resin constituent which carried out 5-50 weight section addition only of the high impact polystyrene, and contained three sorts of resin.

[0071] The thickness of such a cushion layer of monolayer structure usually has desirable about 10-60 micrometers. When the thickness of a cushion layer is less than 10 micrometers, if membrane formation nature is bad and exceeds 60 micrometers, the heat-sealing nature of a lid will worsen.

[0072] \*\* When a cushion layer is a bilayer, drawing 2 is the outline sectional view showing the example of the lid of this invention which made the cushion layer two-layer structure, and the cushion layer 4 consists of 1st resin layer 4a and 2nd resin layer 4b.

[0073] In this case, 1st resin layer 4a is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It can form with an ethylene-alpha olefin copolymer.

[0074] Moreover, 2nd resin layer 4b is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section It can form with the resin constituent with which the hydrogenation object 5 of a 10 - 50 % of the weight of styrene and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections are added. Furthermore, 2nd resin layer 4b is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It can also form to the 10 - 90 % of the weight of ethylene-alpha olefin copolymers, and 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section with the resin constituent with which high impact polystyrene 5 - 50 weight sections are added. Moreover, 2nd resin layer 4b is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section It can form with the resin constituent with which 10 - 50 % of the weight of styrene, the hydrogenation object 5 of a 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections, and high impact polystyrene 5 - 50 weight sections are added.

[0075] Such thickness of 1st resin layer 4a and 2nd resin layer 4b can be set to 5-30 micrometers and about 5-30 micrometers, respectively.

[0076] \*\* When there are three cushion layers, drawing 3 is the outline sectional view showing the example of the lid of this invention which made the cushion layer the three-tiered structure, and the cushion layer 4 consists of 3rd resin layer 4c which touches 1st resin layer 4a, 2nd resin layer 4b, and the heat-sealing layer 5.

[0077] In this case, 1st resin layer 4a is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It is formed with an ethylene-alpha olefin copolymer and 2nd resin layer 4b is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It can form with a 10 - 90 % of the weight of ethylene-alpha olefin copolymers, and 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent.

[0078] And 3rd resin layer 4c is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section It is formed with the resin constituent with which the hydrogenation object 5 of a 10 - 50 % of the weight of styrene and 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections are added. Moreover, 3rd resin layer 4c is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. It can also form to the 10 - 90 % of the weight of ethylene-alpha olefin copolymers, and 70 - 30 % of the weight [ of 50

- 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section with the resin constituent with which high impact polystyrene 5 - 50 weight sections are added. Furthermore, 3rd resin layer 4c is a consistency 0.915 - 0.940 g/cm<sup>3</sup>. 10 - 90 % of the weight of ethylene-alpha olefin copolymers, As opposed to the 70 - 30 % of the weight [ of 50 - 90 % of the weight of styrene, and 50 - 10 % of the weight / of butadienes / styrene-butadiene block copolymers ] resin constituent 100 weight section It can also form with the resin constituent with which 10 - 50 % of the weight of styrene, the hydrogenation object 5 of a 90 - 50 % of the weight [ of butadienes ] styrene-butadiene block copolymer - 30 weight sections, and high impact polystyrene 5 - 50 weight sections are added.

[0079] The thickness of such 1st resin layer 4a, 2nd resin layer 4b, and 3rd resin layer 4c can be set up in 3-20 micrometers, respectively.

[0080] \*\* In case the lid heat sealed by the carrier tape when a lid possessed the cushion layer of the effectiveness book mode of the 3rd mode is exfoliated, the exfoliation between the layers of a cushion layer and a heat-sealing layer or exfoliation by the cohesive failure inside a heat-sealing layer arises. The peel strength in this case is weaker than the heat-sealing reinforcement of the heat-sealing layer and carrier tape which are mentioned later, and it is desirable that it is the range of 100-1200g / 15mm. If peel strength is set to 100g / less than 15mm, in case the carrier tape package object after heat sealing a lid will be transported, the exfoliation between the layers of a cushion layer and a heat-sealing layer or exfoliation by the cohesive failure inside a heat-sealing layer arises, and there is a danger that contents will drop out. Moreover, it is [ a possibility that a carrier tape may vibrate and contents may jump out in the case of exfoliation of a lid ] and is not desirable if peel strength exceeds 1200g / 15mm. In addition, the above-mentioned peel strength is the value of 180-degree exfoliation under 23 degrees C and 40%RH ambient atmosphere (exfoliation rate = a part for 300mm/).

[0081] Therefore, a lid can exfoliate certainly from a carrier tape, after making sufficiently high heat-sealing reinforcement to the carrier tape by the heat-sealing layer and heat sealing it.

[0082] It can be suitably chosen by controlling heat-sealing conditions whether the exfoliation between the layers of the above cushion layers and a heat-sealing layer (interlaminar peeling) is produced here or exfoliation by the cohesive failure in a heat-sealing layer is produced. That is, interlaminar peeling of a cushion layer and a heat-sealing layer can be produced by what the conditions at the time of heat sealing are made severe for (it is high in whenever [ stoving temperature ], and is long in heating time, and pressurization is strengthened), and exfoliation by the cohesive failure in a heat-sealing layer can be produced by making loose the conditions at the time of heat sealing. In the case of interlaminar peeling, as an example of the above-mentioned heat-sealing conditions, it is =140-200 degree C, heating time = 0.5 - 2.0 seconds, and about two pressurization =1.0 - 5.0 kgf/cm whenever [ stoving temperature ], and, in the case of cohesive failure, they are =100-150 degree C, heating time = 0.1 - 1.0 seconds, and pressurization =0.5 - 3.0 kgf/cm<sup>2</sup> whenever [ stoving temperature ]. It is extent.

[0083] In the 3rd mode of this cushion layer, since an adhesive property with a heat-sealing layer can be improved holding the function of a cushion layer, you may consider as a lid combining the heat-sealing layer which consists of conventional heat-sealing material besides in the case of using combining the heat-sealing layer using the transparent conductive heat-sealing material mentioned above. Even in such a case, it is because the same effectiveness can be acquired.

[0084] (Heat-sealing layer) The heat-sealing layer in the lid of this invention is formed using the transparent conductive heat-sealing material mentioned above. Since it is as having mentioned above about this transparent conductive heat-sealing material, explanation here is omitted.

[0085] The amount of coating in the case of using the above-mentioned transparent conductive heat-sealing material as a heat-sealing layer is 0.1 - 8 g/m<sup>2</sup>. It is desirable that it is within the limits. It is because effectiveness seldom changes but poses a problem in cost sides, such as futility of the cost of materials, even when a problem arises in respect of bond strength when fewer than the above-mentioned range, and it applies mostly from the above-mentioned range. Moreover, especially as the coating approach, although not limited, the known coating approaches, such as the gravure direct method or the gravure reversing method, can be used.

[0086] In addition, a heat-sealing layer can be made to contain additives, such as a distributed stabilizer and an antiblocking agent, in this invention if needed. Moreover, spreading formation of the heat-sealing layer can be carried out on a cushion layer.

[0087] (Primer layer) Drawing 4 is the outline sectional view showing other examples in the lid of this invention. In this invention, the primer layer 6 can be formed between the above-mentioned heat-sealing

layer 5 and the above-mentioned cushion layer 4. When it is required that the delamination between the cushion layer 4 and the heat-sealing layer 5 should be controlled especially, or when it is required that the adhesive property of the cushion layer 4 and the heat-sealing layer 5 should be raised, it can apply preferably.

[0088] Since the lid with which the primer layer 6 was formed can raise the feeling of beauty at the time of exfoliating the lid heat sealed by the carrier tape since the delamination between the cushion layer 4 and the heat-sealing layer 5 was controlled and the adhesive property of the cushion layer 4 and the heat-sealing layer 5 can be raised, the adhesive strength of a lid can be adjusted more than moderate reinforcement. Furthermore, in case a lid is heat sealed on a carrier tape, it is effective in the ability to ease the effect of the heat-sealing conditions exerted on delamination or adhesive strength by preparing such a primer layer. In addition, delamination will mean separating easily, if the moderate force is added.

[0089] Such a primer layer can be formed from an olefin, a denaturation olefin, urethane, denaturation urethane, Hydrogenation SBS, or such mixture.

[0090] Among these, as a desirable resin constituent for forming a primer layer, a 0 - 100 % of the weight (SEBS) of styrene-ethylene-butylene-styrene copolymers and 100 - 0 % of the weight [ of styrene-ethylene-butylene-styrene copolymers by which acid denaturation was carried out ] resin constituent can be mentioned. Although it can use preferably even if a styrene-ethylene-butylene-styrene copolymer and the styrene-ethylene-butylene-styrene copolymer by which acid denaturation was carried out are independent respectively, while being able to raise the adhesive property of a primer layer and a cushion layer notably by making it mix in the above-mentioned range, and using them, the adhesive property of a primer layer and a heat-sealing layer can also be raised. Consequently, the heat-sealing layered product of this invention can paste up a cushion layer and a heat-sealing layer by sufficient strength by minding such a primer layer. Furthermore, to this resin constituent, it is desirable that acrylic rubber is added at 60 or less % of the weight of a rate of the whole resin constituent. By adding acrylic rubber at 60 or less % of the weight of a rate of the whole resin constituent, an operation of a primer layer can be demonstrated further and an adhesive property can be raised further.

[0091] In addition, the above-mentioned styrene-ethylene-butylene-styrene copolymer is styrene-Butadiene Styrene by which hydrogenation was carried out, and the above-mentioned styrene-ethylene-butylene-styrene copolymer by which acid denaturation was carried out is a styrene-ethylene-butylene-styrene copolymer whose rate of acid denaturation is 1 - 100%.

[0092] Acrylic rubber is rubber which used acrylic-acid alkyl ester as the principal component. Here, generally as acrylic ester, ethyl acrylate, butyl acrylate, methoxy ethyl acrylate, acrylonitrile, etc. can be mentioned. Moreover, as a functional group for bridge formation which constitutes acrylic rubber, 2-chloro ethyl vinyl ether, other activity halogen content monomers (monochloroacetic acid vinyl, allyl compound chloro acetate, etc.), epoxy group content monomers (allyl glycidyl ether, glycidyl methacrylate, etc.), ethylidene norbornene, etc. can be mentioned.

[0093] The amount of coating of a primer layer is 0.05 - 2.5 g/m<sup>2</sup>. Within the limits is desirable and it is especially 0.1 - 2.0 g/m<sup>2</sup>. Within the limits is desirable. When [ which is not enough when fewer than the above-mentioned range / than the above-mentioned range ] more, it is because it becomes a problem in respect of cost since effectiveness does not change.

[0094] (The manufacture approach of a carrier tape lid) The manufacture approach of the carrier tape lid of this invention can be manufactured by using the laminating approach of the usual film, and is not limited, especially concerning the manufacture approach.

[0095] (Carrier tape lid) Since the heat-sealing layer is formed by transparent conductive heat-sealing material which was mentioned above, even when it heat seals on a carrier tape and is made into a carrier tape package object, the lid of such this invention does not have damage on the contents by the electrostatic discharge, and a problem does not produce it in a check by looking of contents.

[0096] In addition, as an optical property of the lid of this invention itself, it is desirable that Hayes is 25% or less and total light transmission is 70% or more, and it is desirable that Hayes is especially 20% or less, and total light transmission is 80% or more.

[0097] 3. the carrier tape package object above-mentioned carrier tape lid -- a carrier tape top -- heat-sealing \*\*\*\* -- it is used by things as a carrier tape package object. For example, as shown in drawing 5 , on the carrier tape 11 which has the stowage 12 which contains the packed body, in the example shown in drawing 5 , the carrier tape lid 1 pastes up by heat sealing the heat-sealing section H made into the shape of Rhine by predetermined width of face to the both ends of a stowage 12, and is used as a carrier tape package object. As shown also in drawing 5 , the above-mentioned stowage is the thing of the shape of a pocket by which



embossing shaping was usually carried out, and a large number formation is carried out succeeding the longitudinal direction of a carrier tape.

[0098] Such a carrier tape A polyvinyl chloride (PVC), polystyrene (PS), Polyester (A-PET, PEN, PET-G, PCTA), polypropylene (PP), Resin, such as a polycarbonate (PC), a polyacrylonitrile (PAN), and acrylonitrile-butadiene-styrene copolymer (ABS), Or the impalpable powder made from electric conduction which gave the product made from electric conduction to metallic oxides, such as a conductive carbon particle, a metal particle, tin oxide, and a zinc oxide, titanium oxide, as a cure against static electricity, Si system organic compound, and a surfactant are scoured to these, or it is formed in them using what was applied. Moreover, the thing in which the compound sheet plastic which comes to carry out the laminating of PS system, ABS system resin film, or sheet containing carbon black by the co-extrusion in one was formed to one side or both sides of PS system resin sheet or an ABS system resin sheet is also mentioned. Or the thing which made the conductive polymer form in a plastic film front face can also be mentioned as conductive processing.

[0099] In addition, this invention is not limited to the above-mentioned operation gestalt. The above-mentioned operation gestalt is instantiation, and no matter it may be what thing which has the same configuration substantially with the technical thought indicated by the claim of this invention, and does the same operation effectiveness so, it is included by the technical range of this invention.

[0100]

[Example] Hereafter, an example is given and this invention is explained concretely. In addition, this invention is not limited to the following examples.

[0101] On one side of 16 micrometers in [example 1] thickness, and an antistatic type biaxial-stretching polyethylene terephthalate (PET) film (outer layer) It is the urethane system anchor coat agent which carried out optimum dose mixing of the isocyanate system curing agent 0.2 g/m<sup>2</sup> Coating is carried out by the gravure direct method so that it may become (glue line). The laminating of the straight chain-like polyethylene which furthermore carried out the polymerization according to the single site catalyst was carried out by the extrusion laminating method with the thickness of 25 micrometers (cushion layer), and the base material with which the cushion layer was formed through the glue line on the outer layer was obtained. In addition, corona treatment was performed on the straight chain-like polyethylene front face which is the above-mentioned cushion layer, and surface wettability was set to 420micron.

[0102] To the field by the side of the cushion layer of the above-mentioned base material, it is acid denaturation olefin 1.0 g/m<sup>2</sup> as a primer layer. Coating of the amount was carried out by the gravure direct method.

[0103] They are 2 g/m<sup>2</sup> with the gravure reversing method to the field by the side of the cushion layer of the above-mentioned base material, using as transparent conductive heat-sealing material that in which the conductive needlelike tin oxide impalpable powder whose particle size is 0.05 micrometers carried out solid content 200 weight section mixing 50% to the solid content 100 weight section of an acrylic heat-sealing agent. Coating was carried out so that it might become (heat-sealing layer), and the lid was obtained.

[0104] The above-mentioned lid is surface resistivity 10<sup>8</sup>. It is omega/\*\*, 90% of total light transmission, and Hayes 6%, and had the good antistatic engine performance and transparency.

[0105] Moreover, when the fragment of the above-mentioned layered product was carried out to 21.5mm width of face, it considered as the carrier tape lid and it heat sealed at the seal temperature of 140 degrees C on the carrier tape made from polystyrene (PS), a polyvinyl chloride (PVC), and a polycarbonate (PC), the Peel reinforcement was set to 40gf, 45gf, and 40gf, and had the good Peel reinforcement, respectively. Moreover, contents were able to be checked by looking easily.

[0106] The lid was obtained like the example 1 except having changed into the [examples 2-10 and the thing which shows 12] ingredient in Table 1. The evaluation result of a lid is summarized in Table 2. In addition, the Peel reinforcement of front Naka receives polystyrene.

[0107] the [example 11] example 1 -- setting -- the shape of a straight chain -- the lid was obtained like the example 1 except having carried out the dry lamination of the film of polyethylene 30micrometer thickness to PET. The obtained lid was set to Peel on-the-strength 40gf, and had the good Peel reinforcement. Moreover, contents were able to be checked by looking easily.

[0108] In the [example 13] example 11, the lid was obtained like the example 11 except having changed the thickness of PET, and the quality of the material of a primer layer. An evaluation result is summarized in Table 2.

[0109]

[Table 1]



	外層		接着層 <sup>*1</sup>	クッション層		プライマー層		ヒートシール層			混合比 <sup>**</sup>	カール量 (mm)
	材質	厚み ( $\mu\text{m}$ )	材質	材質	厚み ( $\mu\text{m}$ )	材質	塗工量 ( $\text{g}/\text{m}^2$ )	合成樹脂	酸化錫 微粉末	塗工量 ( $\text{g}/\text{m}^2$ )		
実施例1	PET	16	ウレタン	LL	25	変性オレフィン	1.0	アクリル系	(A) <sup>**3</sup>	2.0	100:200	14
実施例2	PET	16	ウレタン	LL	25	変性オレフィン	0.3	アクリル系	(A)	2.0	100:200	14
実施例3	PET	16	ウレタン	LL	25	変性オレフィン	2.0	アクリル系	(A)	2.0	100:200	14
実施例4	PET	25	ウレタン	LL	30	変性オレフィン	1.0	アクリル系	(A)	2.0	100:200	15
実施例5	PET	16	ウレタン	LL	25	変性オレフィン	1.0	アクリル系	(A)	0.5	100:200	14
実施例6	PET	16	ウレタン	LL	25	変性オレフィン	1.0	アクリル系	(A)	4.0	100:200	14
実施例7	PET	16	ウレタン	LL	25	変性オレフィン	1.0	アクリル系	(A)	2.0	100:100	14
実施例8	PET	16	ウレタン	LL	25	変性オレフィン	1.0	アクリル系	(A)	2.0	100:400	14
実施例9	PET	16	ウレタン	LDPE	25	変性オレフィン	0.6	アクリル系	(A)	2.0	100:200	18
実施例10	PP	16	ウレタン	EMAA	25	変性オレフィン	1.0	アクリル系	(A)	2.0	100:200	2
実施例11	PET	16	ウレタン	LL	30	変性オレフィン	1.0	アクリル系	(A)	2.0	100:200	13
実施例12	PET	16	ウレタン	LL	30	変性オレフィン	1.0	アクリル系	(A)	2.0	100:200	13
実施例13	PET	12	ウレタン	LL	30	水素化SBS	1.0	アクリル系	(A)	2.0	100:200	13

\* 1: イソシアネート系硬化剤入り、 \* 2: 合成樹脂: 酸化錫微粉末の混合比(重量基準)、 \* 3: 針状酸化錫微粒子  
 PET: ポリエチレンテレフタレート、 PP: ポリエチレン、 LL: 直鎖状ポリエチレン、 LDPE: 低密度ポリエチレン、  
 EMMA: エチレン・メタクリル酸共重合体、 水素化SBS: 水素化スチレンーエチレンーブタジエーン・スチレンブロック共重合体

[0110]

Table 2

	表面抵抗率 [ $\Omega/\square$ ]	全光線透過率 [%]	ヘイズ [%]	ピール強度 [ $\text{gf}/\text{mm}$ ]
実施例1	$2 \times 10^8$	90	6	40
実施例2	$2 \times 10^8$	91	6	40
実施例3	$2 \times 10^8$	90	6	45
実施例4	$2 \times 10^8$	89	7	35
実施例5	$2 \times 10^8$	90	5	38
実施例6	$2 \times 10^8$	89	7	41
実施例7	$7 \times 10^8$	90	6	43
実施例8	$1 \times 10^7$	89	7	38
実施例9	$2 \times 10^8$	89	7	45
実施例10	$2 \times 10^8$	91	6	35
実施例11	$2 \times 10^8$	89	8	35
実施例12	$2 \times 10^8$	89	8	35
実施例13	$2 \times 10^8$	89	8	35

[0111] Next, the example at the time of changing the quality of the material of a primer layer is given, and this invention is explained still more concretely.

[0112] On one side of 12 micrometers in [example 14] thickness, and an antistatic type biaxial-stretching polyethylene terephthalate (it expresses with PET all over Table 3.) film (outer layer) Urethane system adhesives which carried out optimum dose mixing of the isocyanate system curing agent (it expresses with urethane all over Table 3.) Straight chain-like polyethylene which carried out coating by the gravure direct method so that it might be set to 4.0g/m<sup>2</sup> (glue line), and carried out the polymerization according to the single site catalyst further (it expresses with LL all over Table 3.) The laminating of the film (cushion layer) 30micrometer was carried out in the dry lamination, and the base material with which the cushion layer was formed through the glue line on the outer layer was obtained.

[0113] Styrene-ethylene-butylene-styrene copolymer (it expresses with SEBS all over Table 3.) 1.0 g/m<sup>2</sup> which is the resin constituent which forms a primer layer in the field by the side of the cushion layer of the above-mentioned base material Coating of the amount was carried out by the gravure direct method.

[0114] They are 2.1 g/m<sup>2</sup> with the gravure reversing method to the field by the side of the cushion layer of the above-mentioned base material, using as transparent conductive heat-sealing material that in which the conductive needlelike tin oxide impalpable powder whose particle size is 0.05 micrometers carried out solid content 200 weight section mixing 50% to the solid content 100 weight section of an acrylic heat-sealing agent. Coating was carried out so that it might become (heat-sealing layer), and the lid was obtained.

[0115] The above-mentioned lid is surface resistivity  $3 \times 10^7$ . It is  $\omega/\text{cm}$ \*\*, 90.3% of total light transmission, and Hayes 6.4%, and had the good antistatic engine performance and transparency.

[0116] Moreover, when the fragment of the above-mentioned layered product was carried out to 21.5mm width of face, it considered as the carrier tape lid and it heat sealed at the seal temperature of 150 degrees C on the carrier tape made from polystyrene (PS), the Peel reinforcement was set to 39gf(s) and had the good Peel reinforcement. Moreover, contents were able to be checked by looking easily.

[0117] The lid was obtained like the example 14 except having changed into what shows the resin constituent which forms a [examples 15-22] primer layer, and its amount of coating in Table 3. The evaluation result of a lid is summarized in Table 4.

[0118]

[Table 3]

	外層		接着層		クッション層		プライマー層				ヒートシール層	
	材質	厚み ( $\mu\text{m}$ )	材質	厚み ( $\mu\text{m}$ )	材質	厚み ( $\mu\text{m}$ )	SEBS	酸変性 SEBS	アクリル ゴム	塗工量 ( $\text{g}/\text{m}^2$ )	合成樹脂: 酸化錫 (混合比)	塗工量 ( $\text{g}/\text{m}^2$ )
実施例14	PET	12	ウレタン	LL	30	100	0	0	0	1.0	100:200	2.1
実施例15	PET	12	ウレタン	LL	30	0	100	0	0	1.0	100:200	1.9
実施例16	PET	12	ウレタン	LL	30	50	50	0	0	1.0	100:200	2.0
実施例17	PET	12	ウレタン	LL	30	47	47	6	6	1.1	100:200	2.0
実施例18	PET	12	ウレタン	LL	30	30	60	10	10	1.0	100:200	2.2
実施例19	PET	12	ウレタン	LL	30	0	90	10	10	0.9	100:200	2.2
実施例20	PET	12	ウレタン	LL	30	90	0	10	10	1.2	100:200	2.1
実施例21	PET	12	ウレタン	LL	30	47	47	6	6	0.3	100:200	2.3
実施例22	PET	12	ウレタン	LL	30	47	47	6	6	3.0	100:200	2.0

PET: ポリエチレンテレフタレート、LL: 直鎖状ポリエチレン、  
 SEBS: スチレン-エチレン-ブチレン-スチレン共重合体、  
 酸変性SEBS: 酸変性されたスチレン-エチレン-ブチレン-スチレン共重合体

[0119]

[Table 4]

	表面抵抗率 [ $\Omega/\square$ ]	全光線透過率 [%]	ヘイズ [%]	シール温度 [ $^{\circ}\text{C}$ ]	ピール強度 [ $\text{gf}/\text{mm}$ ]
実施例14	$3 \times 10^7$	90.3	6.4	150	39
実施例15	$3 \times 10^7$	89.6	6.7	135	61
実施例16	$1 \times 10^7$	90.5	6.8	140	50
実施例17	$6 \times 10^6$	90.3	6.9	155	40
実施例18	$1 \times 10^6$	89.3	7.3	155	40
実施例19	$7 \times 10^7$	89.9	6.2	140	44
実施例20	$7 \times 10^6$	90.2	7.7	160	31
実施例21	$1 \times 10^7$	90.7	7.3	160	40
実施例22	$3 \times 10^7$	90.5	7.5	145	42

[0120] (Measuring condition of Hayes and total light transmission) It measured in color computer SM[ by Suga Test Instruments Co., Ltd. ]-5SC.

[0121] (Measuring condition of surface resistivity) It measured by Huy Lester IP by Mitsubishi Petrochemical Co., Ltd. under 22 degrees C and 40%RH.

[0122] (Measuring condition of the Peel reinforcement) The mincement of the obtained heat-sealing layered product was carried out to 21.5mm width of face, and it considered as carrier tape lid material, and heat sealed with the carrier tape made from (Polystyrene PS) of 24mm width of face, and the Peel reinforcement was measured.

[0123] (Evaluation conditions of the amount of curl) After leaving it until it cut the lid on 15cm square, it put slitting of the shape of 4cmx4cm x into the core and the amount of curl was stabilized, it observed from the side face, the distance of the part and a lid flat surface most distant from the lid flat surface of a slitting center section was measured, and this was made into the amount of curl.

[0124]

[Effect of the Invention] Since the conductive particle to which 50% particle size has the particle size below the short wavelength region of the light of 0.40 micrometers or less in the synthetic resin which can be heat sealed contains the transparent conductive heat-sealing material of this invention, it does so the effectiveness that it can consider as the heat-sealing material which has conductivity and was excellent in transparency.

[Translation done.]

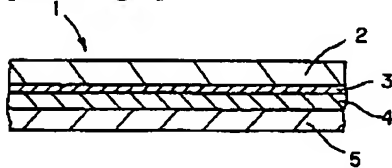
## \* NOTICES \*

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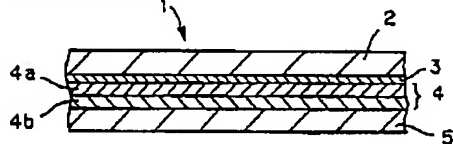
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

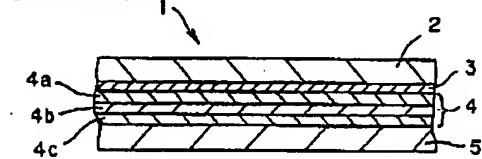
[Drawing 1]



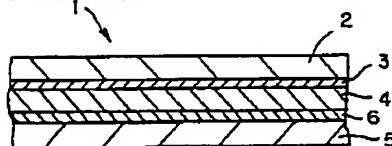
[Drawing 2]



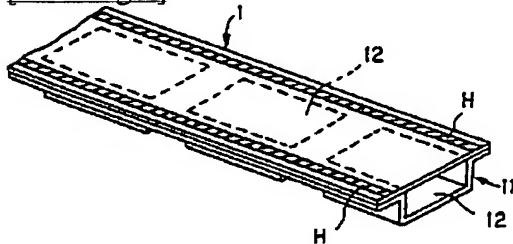
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]